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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/014,466

12/11/2001

Arkadii V. Samoilov

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USA/PDC/OSI/BG

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32588

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06/05/2003

APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

KUNEMUND, ROBERT M

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 06/05/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

AS7

Office Action Summary

Application No.

10/014,466

Applicant(s)

SAMOILOV ET AL.

Examiner

Robert M Kunemund

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-75 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-75 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6 6) ☐ Other:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 to 4 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liaw (Applied Physics Letters vol. 75) in view of EP 1,065,728.

The Liaw et al reference teaches a method of depositing multi-layers. On a substrate, a layer of silicon-germanium is deposited by low-pressure chemical vapor deposition. The silicon source is silane. The germanium concentration increases in the height of the layer. A layer of constant composition SiGe is deposited on the first layer. Then a third layer of graded SiGe is deposited where the germanium concentration is decreased during the height of the layer, note, entire reference. The sole difference between the instant claims and the prior art is the carbon in the graded layers.

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However, the EP 1,065,728 reference teaches graded layers of SiGe with carbon incorporation. The carbon content can also be graded with the germanium content, note entire reference and particularly pages 4 and 5. It would have been obvious to one of ordinary skill in the art to modify the Liaw reference by the teachings of the EP 1,065,728 reference to incorporate carbon in order to narrow the band gap and maintain a high quality crystal.

Claims 5 to 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liaw (Applied Physics Letters vol. 75) in view of EP 1,065,728.

The Liaw et al and EP 1,065,728 references are relied on for the same reasons as stated, supra, and differ from the instant claims in the germanium content. However, in the absence of unexpected results, it would have been unobvious to one of ordinary skill in the art to determine through routine experimentation the optimum, operable germanium contents in the graded layers in the Liaw et al process in order to obtain the desired properties.

Claims 13, 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liaw et al in view of EP 1,065,728 and Pogossian et al.

The Liaw et al and EP 1,065,728 references are relied on for the same reasons as stated, supra, and differ from the instant claims in the addition cladding layer of silicon. However, the Pogossian et al reference teaches a SiGe device where silicon-cladding layers are deposited below and above the graded layers, note, figure 3. It would have been obvious to one of ordinary skill in the art to modify the Liaw et al

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process in view of the Pogossian et al reference to add silicon-cladding layers in order to increase the optical properties of the SiGe layers.

Claims 15 to 19, 26 to 45, 50 to 55, and 60 to 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liaw et al in view of Pogossian et al.

The Liaw et al and EP 1,065,728, Pogossian et al references are relied on for the same reasons as stated, supra, and differ from the instant claims in the patterning of the deposition. However, in the absence of unexpected results, it would have been unobvious to one of ordinary skill in the art to determine through routine experimentation the optimum, operable patterning of the growth in the combine prior art in order to create the desired optical path.

Claims 21 to 25, 46 to 49 and 56 to 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liaw et al in view of EP 1,065,728 and Pogossian et al.

The Liaw et al, EP 1,065,728 and Pogossian et al references are relied on for the same reasons as stated, supra, and differ from the instant claims in the programming. However, in the absence of unexpected results, it would have been unobvious to one of ordinary skill in the art to determine through routine experimentation the optimum, operable programming of the growth in the combine prior art in order to create a program to run the process as a constant.

Examiner's Remarks

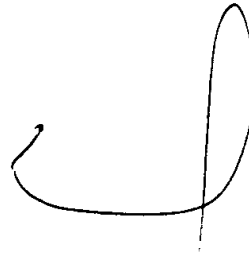
The remaining references are merely cited of interest as showing the state of art.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert M Kunemund whose telephone number is 703-308-1091. The examiner can normally be reached on 8 hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ben Utech can be reached on 703-308-3636. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.

A handwritten signature in black ink, appearing to be 'R. Kunemund', written over a horizontal line.

RMK
May 30, 2003

**ROBERT KUNEMUND
PRIMARY EXAMINER**